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| | | |
|---------------------------------|---|-------------------------|
| In re Application of: |) | |
| TONY SKUSE et al. |) | Group Art Unit 2875 |
| |) | |
| Serial No. 10/619,753 |) | |
| |) | |
| Filed: July 15, 2003 |) | |
| |) | |
| For: APPARATUS FOR ILLUMINATING |) | Attorney Docket 1-24641 |
| AND/OR VENTING THE INTERIOR |) | |
| OF A BUILDING |) | |

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LETTER TRANSMITTING PRIORITY DOCUMENTS

Honorable Sir:

Enclosed are certified copies of the two priority documents for the above-identified application.

Respectfully submitted,

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INVESTOR IN PEOPLE

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Concept House
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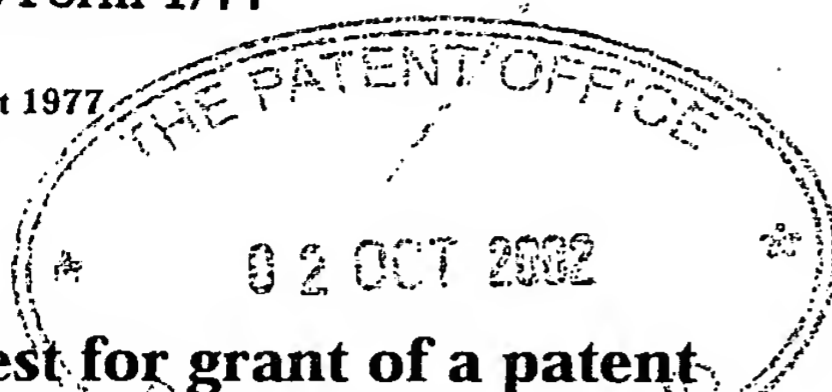
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Signed

Dated 4 August 2003





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P01/7700 0440-02/2820.3

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1. Your reference

HL83192/000/ASG

0222820.3

2. Patent application number

(The Patent Office will fill in this part)

8475657001

3. Full name, address and postcode of the or of each applicant (underline all surnames)

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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

8429185001

8429201001

4. Title of the invention

APPARATUS FOR ILLUMINATING AND/OR VENTING THE INTERIOR OF A BUILDING

5. Name of your agent (if you have one)

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London
WC2B 6UD

Patents ADP number (if you know it)

34001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

GB

0216918.3

20 July 2002

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

No

- a) any applicant named in part 3 is not an inventor, or
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Patents Form 1/77

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Continuation sheets of this form -
Description 12
Claim(s) 4
Abstract 1
Drawing(s) 10

10. If you are also filing any of the following, state how many against each item.

Priority documents -
Translations of priority documents -
Statement of inventorship and right to grant of a patent (Patents Form 7/77) -
Request for preliminary examination and search (Patents Form 9/77) 1
Request for substantive examination (Patents Form 10/77) -
Any other documents (please specify) -

11. I/We request the grant of a patent on the basis of this application.

Signature

Date

1 October 2002

12. Name and daytime telephone number of person to contact in the United Kingdom

Mr A S Giles

[0117] 910 3200

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APPARATUS FOR ILLUMINATING AND/OR VENTING THE INTERIOR
OF A BUILDING

This invention relates to apparatus for illuminating
5 and/or venting the interior of a building and
particularly, although not exclusively, relates to
skylights and/or roof vents.

When domestic or commercial roof spaces are used as
10 living accommodation, storage or office space, it is
preferable that they are at least partially lit by
natural light. Sometimes this is achieved by fitting
Velux (registered trade mark) or Dormer windows.
Although modern Velux and Dormer windows are functional
15 and attractive, planning permission for such structures
on a roof is sometimes refused, or they are considered
undesirable by the owner of the building. In such
circumstances, it is known to provide a skylight
comprising a light reflective tube which passes through
20 the roof and projects above the level of the roof. The
tube is capped by a light transmissive cover which
projects still further above the surface of the roof.
The whole assembly is unnecessarily cumbersome and
unsightly.

25

STATEMENTS OF INVENTION

According to a first aspect of the present invention
there is provided apparatus for illuminating the
30 interior of a building through a roof of the building,
the apparatus comprising a light transmissive panel
which has an upper surface which is substantially
identical in shape to an upper surface of a roof
covering and which lies in the plane of the said

covering, and a light directing duct which directs light from the panel into the interior of the building.

5 Preferably, the light directing duct is fitted to an underside of the panel. Most preferably the light directing duct is sealed to an underside of the panel. For example it may be attached permanently with adhesive or a sealant and/or may be sealed with a resilient gasket.

10

Preferably, the upper surface of the panel is flush with an upper surface of the covering.

15 Preferably, the covering comprises roof tiles, shingles, slates or roofing sheets and the panel matches the contour and spacing of one or more roof tiles, shingles, slates or roofing sheets.

20 Preferably, the panel comprises a first light transmissive portion which is aligned with the light directing duct and an opaque portion. Preferably, the opaque portion is coloured and/or textured to match the roof covering.

25 Preferably, the duct passes through an underlay layer of the roof. The underlay layer may be sealed to an outer surface of the duct. For example, it may be sealed with a resilient gasket.

30 Preferably, the panel further comprises an air vent for allowing air from outside the roof to circulate through the duct. Preferably, an upper section of the duct includes apertures which allow the air to pass into and out of the duct.

Preferably, a lower end of the duct is provided with a light transmissive cover. Preferably, at least part of the panel and/or the cover are transparent or
5 translucent. Preferably, the panel and/or the cover are made from a plastics material such as polycarbonate.

It is well known that the temperature difference
10 between the outside of a roof and the roof space beneath the roof can cause a build up of condensation within the roof space. This problem can be alleviated by venting the roof, so that fresh outside air flows across the roof space, thereby reducing the temperature
15 within the roof space and reducing the humidity. It is known to vent roofs through vents provided under the eaves or above the weather boarding. This can provide some limited through flow of air, but the venting is greatly improved if vents are also provided along the
20 ridge line of the roof. Conventional ridge vents project above the level of the roof and are unsightly.

According to a second aspect of the present invention, there is provided apparatus for venting the interior of
25 a building, the apparatus comprising a venting panel having at least one venting channel, and having an upper surface which is substantially identical in shape to, and lies in the plane of, an outer covering of the building, the interior of the building being vented
30 through the panel.

Preferably, the outer covering is a roof covering of the building such as tiles, shingles, slates or roofing sheets.

The venting channel may comprise a flow passage formed in or attached to the venting panel.

- 5 Preferably, the venting channel comprises an inlet at an edge of the panel and a plurality of air directing fins associated with the inlet. Preferably, a portion of at least one of the fins is offset relative to the inlet or is curved, to prevent rainwater entering the
10 inlet. At least one of the fins may have a corrugated profile, and may extend in a direction substantially perpendicular to the inlet.

Preferably, a duct is provided which is in fluid
15 communication with the channel formed in the roof tile, the duct passing into the interior of the building.

Preferably a fan is provided which is adapted to assist the flow of air through the panel and/or the duct.
20

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, and to show more clearly how it may be carried into
25 effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figure 1 is a cross section through a first embodiment of skylight;
30

Figure 2 is a top view of the skylight of Figure 1;

Figure 3 is a perspective view of a large skylight;

Figure 4 is a perspective view of multiple skylights fitted to a single light transmissive panel;

5 Figure 5 is a cross section through a two part skylight assembly;

Figure 6 is a plan view of a corrugated polycarbonate panel fitted with a light directing duct in accordance with the present invention;

10

Figure 7 is a cross section through the embodiment of Figure 6;

15 Figure 8 is a cross section through a skylight integrally formed with an air vent;

Figure 9 is a perspective view of an artificial roof tile in accordance with the embodiment of Figure 8;

20 Figure 10 is a perspective view of an artificial roof tile combining the functions of skylight and roof vent;

Figure 11a is a view on the lower end of an artificial roof tile showing a vent opening;

25

Figure 11b is a cut-away plan view of the end of the roof tile illustrated in Figure 11a;

30 Figure 12a is a view on the lower end of an artificial roof tile showing a vent opening; and

Figure 12b is a cut-away plan view of the end of the artificial roof tile of Figure 12a.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Figures 1 and 2 show a first embodiment of skylight 1 comprising a cylindrical housing 2 fitted into a cylindrical opening 4 formed in a tile 6. The cylindrical housing 2 is provided with an annular flange 8 which sits in a recess 10 formed in an upper surface of the tile 6 and prevents the cylindrical housing 2 slipping through the tile 6 in service. The cylindrical housing 2 and annular flange 8 are sealed to the tile 6 by means of adhesive, sealant or a sealing gasket arrangement (not shown) so that the joint between the cylindrical housing 2 and tile 6 is weatherproof.

The cylindrical housing 2 projects from the bottom of the tile 6 and is connected to a cylindrical light directing duct 12. In the illustrated embodiment, and the cylindrical housing 2 is closely received within an end of the light directing duct 12. The joint between the cylindrical housing 2 and light directing duct 12 is sealed by flexible sealant. However, the cylindrical housing 2 and light directing duct 12 may be of any desired shape and may be interconnected in any conventional manner. For example, the external diameter of the light directing duct 12 may be smaller than the internal diameter of the cylindrical housing 2 so that the light directing duct 12 is received within the cylindrical housing 2. Such an arrangement would be inherently more weatherproof, since rainwater could not easily penetrate the gap between the cylindrical housing 2 and light directing duct 12.

The upper end of the cylindrical housing 2 is sealed off by a light transmissive element 14 which forms, with the tile 6, a light transmissive panel 13. The opposite end of the light directing duct 12 is closed off by a light transmissive cover 16. Furthermore, the inside surface 17 of the light directing duct 12 and/or the cylindrical housing 2 is coated with light reflecting material, such as is used in a conventional lamp reflector.

10

The light transmissive element 14 and light transmissive cover 16 may be formed from any transparent or translucent material, such as Perspex or polycarbonate. Furthermore, the tile 6 may be replaced with an artificial tile so that the cylindrical housing 2 and tile 6 may be moulded together as an integral unit. Indeed, if the artificial tile 6 is made of light transmissive material, such as Perspex or polycarbonate, the cylindrical housing 2, tile 6 and light transmissive element 14 can be integrally moulded together to form the light transmissive panel 13. The portion of the artificial tile 6 which does not need to be light transmissive can be opaqued by means of painting or the addition of a surface finish, so that it matches the surrounding roof tiles.

In an alternative embodiment (not shown) the cylindrical housing 2, light directing duct 12, light transmissive element 14 and light transmissive cover 16 could be formed together as a sealed evacuated or gas filed unit. In such a sealed arrangement, condensation within the unit would not be a problem. However, in the embodiment of Figures 1 and 2, in which the cylindrical housing 2 is separate from the light

directing duct 12, it is preferable to include vent holes 18 which are open to the ambient air circulating beneath the tile 6. The vent holes allow the ambient air to circulate through the space between the light transmissive element 14 and light transmissive cover 16 and prevent a build up of condensation within the unit.

The skylight 1 is attached to a roof by removing a section of roof tiles to gain access to an underlay layer 20. A hole is formed through the underlay layer 20 through which is fitted the light directing duct 12. The duct is sealed to the underlay layer by means for a gasket 22. The tile 6 is then lowered into position, such that the cylindrical housing 2 fits within the light directing duct 12, and the gap between the two is sealed with flexible sealant. Finally, the surrounding tiles are made good.

As the skylight is located within a tile or artificial tile, when installed, and does not project above the upper surface of the tile the surface profile of the roof is maintained and all that is visible from the outside of the roof is the light transmissive element 14.

Figure 3 shows an alternative arrangement in which a single large light transmissive element 14 is fitted within a light transmissive panel 13 which is shaped to simulate four separate roof tiles, although it is integrally moulded as a single element. This is achieved by moulding into the panel 13 a step 22 to simulate the joint between upper and lower tiles and a groove 24 to simulate the gap between tiles laid side by side.

Figure 4 shows a further embodiment in which a single integrally formed light transmissive panel 13 is moulded to simulate four separate tiles and includes four individual light transmissive elements 14. The embodiments illustrated in Figures 3 and 4 increase the amount of light which is directed into a space beneath the roof for the minimal additional effort in fitting the skylight.

10

Figure 5 shows an alternative embodiment of skylight in which the light transmissive element 14, the cylindrical housing 2 and the annular flange 8 are integrally formed together from light transmissive material and are inserted into a real or artificial tile 6 to form the light transmissive panel 13. As in the embodiment of Figures 1 and 2, vent holes 18 are formed in the cylindrical housing 2 and the base of the cylindrical housing 2 is adapted to receive a light directing duct 12.

20

Figures 6 and 7 show a further embodiment of skylight 1 in which the light transmissive panel 13 is formed by the roof covering itself. More specifically, the light transmissive panel 13 comprises a conventional corrugated polycarbonate roofing panel 26 to which the cylindrical housing 2 is fitted by means of adhesive or sealant applied to the flange 8. As in the previous embodiments, a separate light directing duct 12 is connected to the cylindrical housing 2, but in this embodiment it is received within the cylindrical housing 2.

30

In order to ensure an adequate seal between the roofing panel 26 and the cylindrical housing 2 the upper edge of the cylindrical housing 2 is shaped to accommodate the corrugations of the roofing panel 26.

5

Figures 8 to 12 show a roof vent 30 in accordance with a second aspect of the present invention. The roof vent comprises a panel 32 which may be opaque (Figure 9) or wholly or partially light transmissive (Figure 10), and has an upper surface which is substantially identical in shape to, and lies in the plane of an outer covering of a roof.

Referring specifically to Figures 8 and 10, the panel 32 is formed from plastics material and is moulded in the shape of a conventional roof tile on its upper surface and in the regions 34, 36 which are adapted to engage with other tiles on the roof. However, the underside of the panel 32 at its lower edge 38 is formed with a series of fins or baffles 40. The baffles 40 project at right angles from the underside of the panel 32 and extend downwards as far as an underlying tile 42, so that vent channels 44 are defined between respective pairs of baffles 40.

25

In the Figure 8 embodiment, the panel 32 is formed entirely from polycarbonate. The upper surface of the panel 32 is coated in the regions 44, 46, so that these regions are opaque and substantially match the appearance of neighbouring tiles on the roof. The circular portion of the upper surface of the panel 32 between the opaque portions 44, 46 is left transparent and acts as a light transmitting element 48. Beneath the light transmitting element 48 is fitted a

30

cylindrical housing 50 which is sealed to the panel 32 by means of an annular flange 52. A cylindrical light directing duct 54 is closely received within the cylindrical housing 50 and is held in position by
5 adhesive or sealant.

Vent holes 56 are formed through the cylindrical housing 50 and light directing duct 54 and a vent passage 57 is formed in the panel 32 between the
10 baffles 40 and the cylindrical housing 50. The interior of the light directing duct 54 is held in fluid communication with the vent channels 44 formed in the underside of the panel 32 via the vent holes 56 and the vent passage 57.

15

If the lower end of the light directing duct 54 is closed by a transparent or translucent cover, the vents merely operate to prevent condensation within the light directing duct 54. However, if the lower end of the
20 light directing duct 54 is left open, or additional vent holes are provided at a lower end of the light directing duct 54, ambient air is able to pass from the vent channels 42 into the roof space, via the vent holes 56 and the light directing duct 54. Thus, vent
25 panel 32 can be used either with a skylight assembly, or on its own as a means of venting a roof or loft space.

Figure 11 shows an alternative embodiment in which the
30 lower end 38 of the panel 32 is formed as a hollow tube having an upper wall 58 and a lower wall 60, which are spaced apart by a plurality of staggered rows of posts 62. The upper wall 58, lower wall 60 and posts 62 define a tortuous flow path P for air entering the

panel 32, so that rain is unable to find a direct path and is prevented from penetrating beyond the first few rows of posts 62 of the panel 32.

- 5 Figures 12a and 12b show a further embodiment in which the lower end 38 of the panel 32 is provided with an upper wall 58 and a lower wall 60 spaced apart by baffles 64 which are corrugated in cross section. These baffles 64 act in the same way as the posts 62,
10 since they force air entering the panel 32 to follow a tortuous path P which prevents the ingress of rain.

CLAIMS

1. Apparatus for illuminating the interior of a building through a roof of the building, the apparatus
5 comprising a light transmissive panel which has an upper surface which is substantially identical in shape to an upper surface of a roof covering and which lies in the plane of the said covering, and a light directing duct which directs light from the panel into
10 the interior of the building.
2. Apparatus as claimed in claim 1, in which the light directing duct is fitted to an underside of the panel.
15
3. Apparatus as claimed in claim 1 or 2, in which the light directing duct is sealed to an underside of the panel.
- 20 4. Apparatus as claimed in claim 3, in which the light directing duct is sealed to the panel with a gasket.
5. Apparatus as claimed in any one of the preceding
25 claims, in which the upper surface of the panel is flush with an upper surface of the covering.
6. Apparatus as claimed in any one of the preceding claims, in which the covering comprises roof tiles, shingles, slates or roofing sheets, and the panel
30 matches the contour and spacing of one or more roof tiles, shingles, slates or roofing sheets.

7. Apparatus as claimed in any one of the preceding claims, in which the panel comprises a first light transmissive portion which is aligned with the light directing duct and an opaque portion.

5

8. Apparatus as claimed in claim 7, in which the opaque portion is coloured to match the roof covering.

9. Apparatus as claimed in claim 7 or 8, in which the
10 opaque portion is textured to match the roof covering.

10. Apparatus as claimed in any one of the preceding claims, in which the duct passes through an underlay layer of the roof.

15

11. Apparatus as claimed in claim 10, in which the underlay layer is sealed to an outer surface of the duct.

12. Apparatus as claimed in claim 11, in which the
20 underlay layer is sealed to the outer surface of the duct by means of a gasket.

13. Apparatus as claimed in any one of the preceding
25 claims, in which the panel further comprises an air vent for allowing air from outside the roof to circulate through the duct.

14. Apparatus as claimed in claim 13, in which the
30 upper section of the duct includes apertures which allow air from the air vent to pass into and out of the duct.

15. Apparatus as claimed in any one of the preceding claims, in which the lower end of the duct is provided with a light transmissive cover.

5 16. Apparatus as claimed in claim 15, in which the panel and/or the cover are transparent or translucent.

17. Apparatus as claimed in claim 15 or 16, in which the panel and/or the cover are made from a plastics
10 material.

18. Apparatus for venting the interior of a building, the apparatus comprising a venting panel having at least one venting channel, and having an upper surface
15 which is substantially identical in shape to, and lies in the plane of, an outer covering of the building, the interior of the building being vented through the channel.

20 19. Apparatus as claimed in claim 18, in which the outer covering is a roof covering of the building.

20. Apparatus as claimed in claim 18 or 19, in which the covering comprises tiles, shingles, slates or
25 roofing sheets.

21. Apparatus as claimed in any one of claims 18 to 20, in which the venting channel comprises a flow passage formed in or attached to the venting panel.

30

22. Apparatus as claimed in any one of claims 18 to 21, in which the venting channel comprises an inlet at an edge of the panel and a plurality of air directing fins associated with the inlet.

23. Apparatus as claimed in claim 22, in which a portion of at least one of the fins is offset relative to the inlet.

5

24. Apparatus as claimed in claim 22 or 23, in which at least one of the fins has a corrugated cross section.

10 25. Apparatus as claimed in any one of claims 22 to 24, in which at least one of the fins extends in a direction substantially perpendicular to the inlet opening.

15 26. Apparatus as claimed in any one of claims 18 to 25, further comprising a duct which is in fluid communication with the channel formed in the light transmissive panel, the duct passing into the interior of the building.

20

27. Apparatus as claimed in any one of claims 18 to 26, further comprising a fan which is adapted to assist the flow of air through the panel and/or the duct.

25 28. Apparatus for illuminating the interior of a building substantially as described herein, with reference to and as shown in the accompanying drawings.

29. Apparatus for venting the interior of a building
30 substantially as described herein, with reference to and as shown in the accompanying drawings.

ABSTRACTAPPARATUS FOR ILLUMINATING AND/OR VENTING THE INTERIOR
OF A BUILDING

- 5 Apparatus for illuminating the interior of a building through a roof of the building, the apparatus comprising a light transmissive panel 13 and a light directing duct 12. The panel 13 has an upper surface which is substantially identical in shape to an upper
10 surface of a roof covering and lies in the plane of the said covering. The light directing duct 12 directs light from the panel 13 into the interior of the building.
- 15 The invention also relates to apparatus for venting the interior of a building. The apparatus comprises a venting panel 32 having at least one venting channel 44, and having an upper surface which is substantially identical in shape to, and lies in the plane of an
20 outer covering of the building. The interior of the building is vented through the panel 32.



1/10

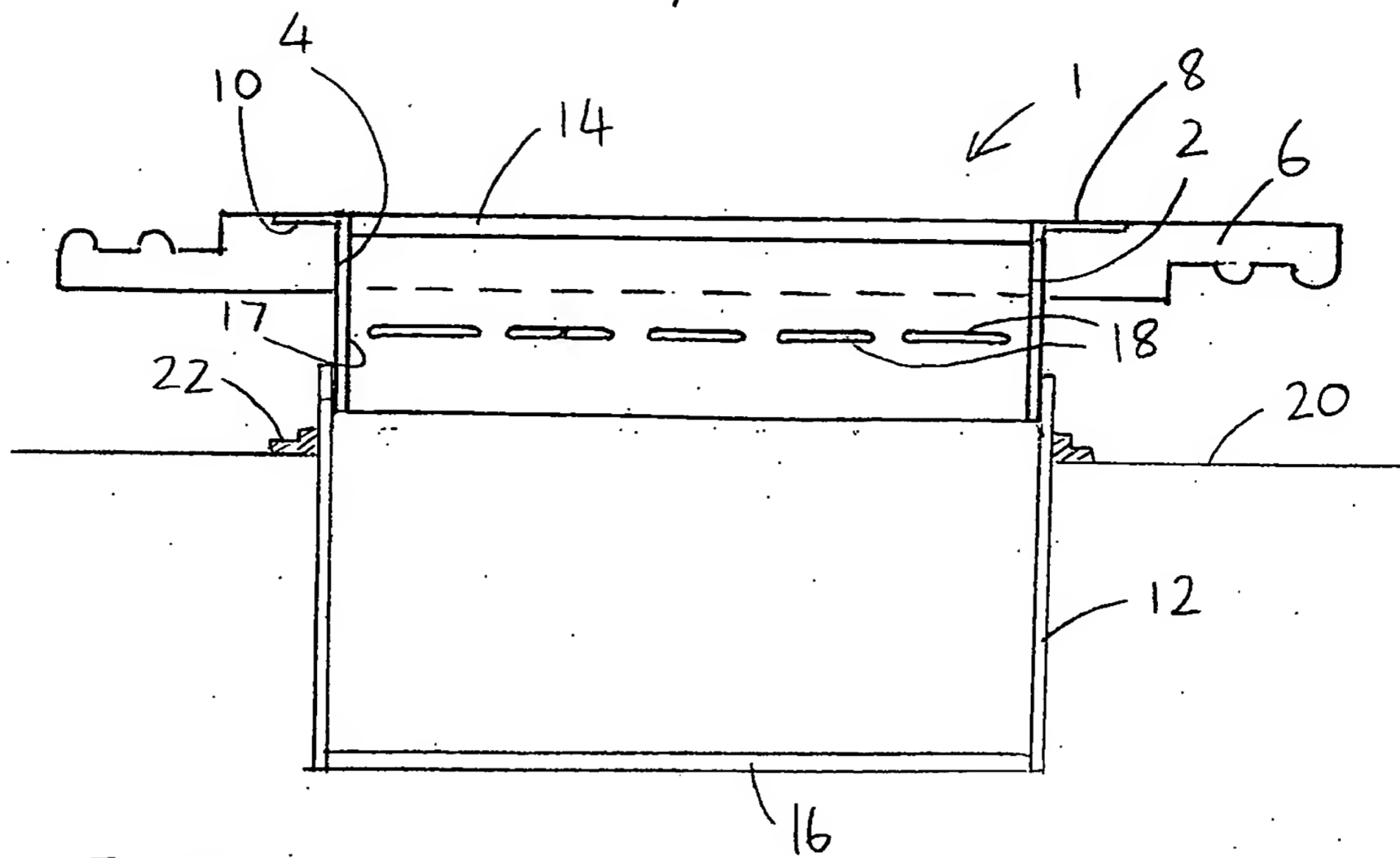


FIGURE 1

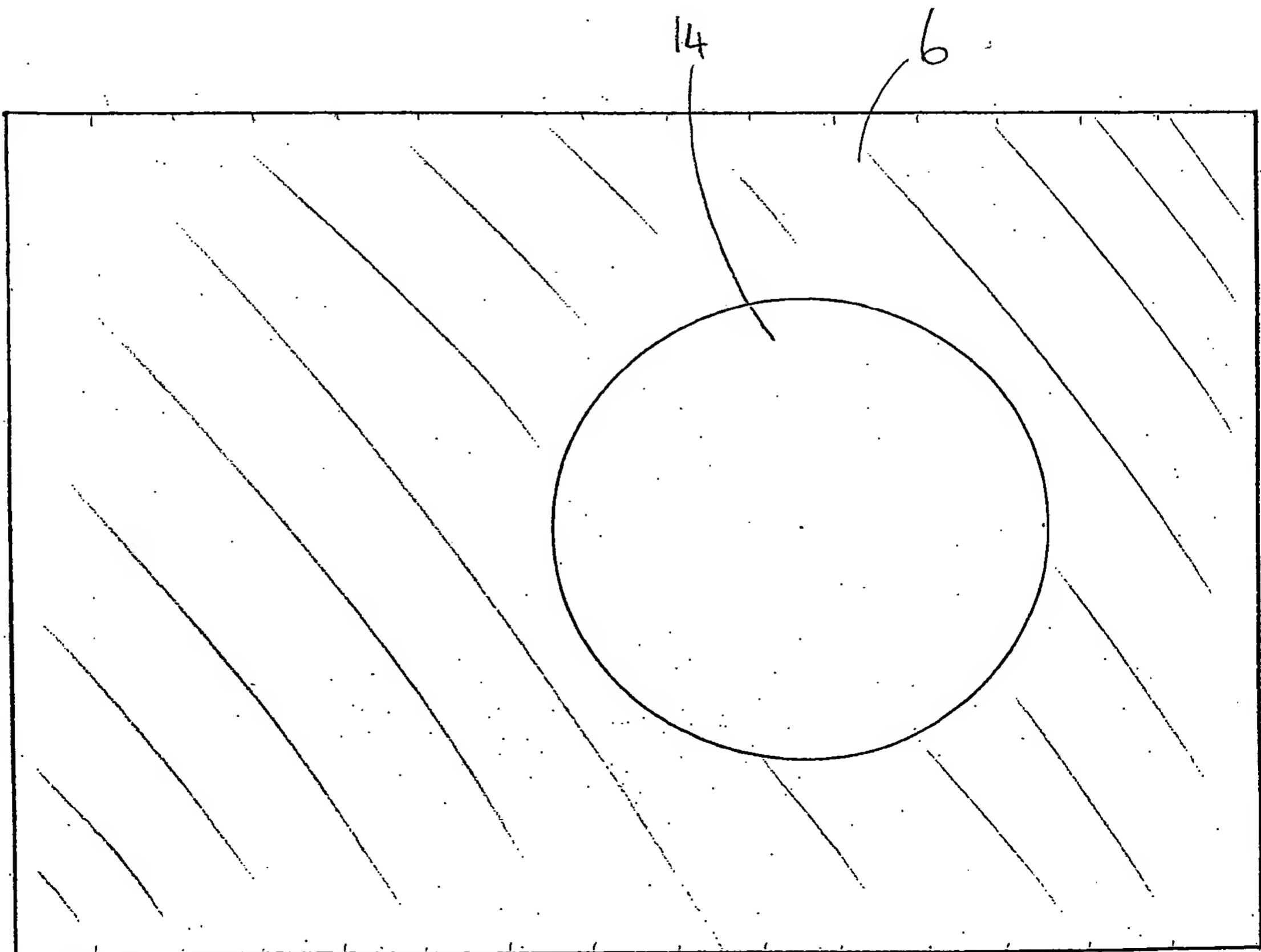


FIGURE 2



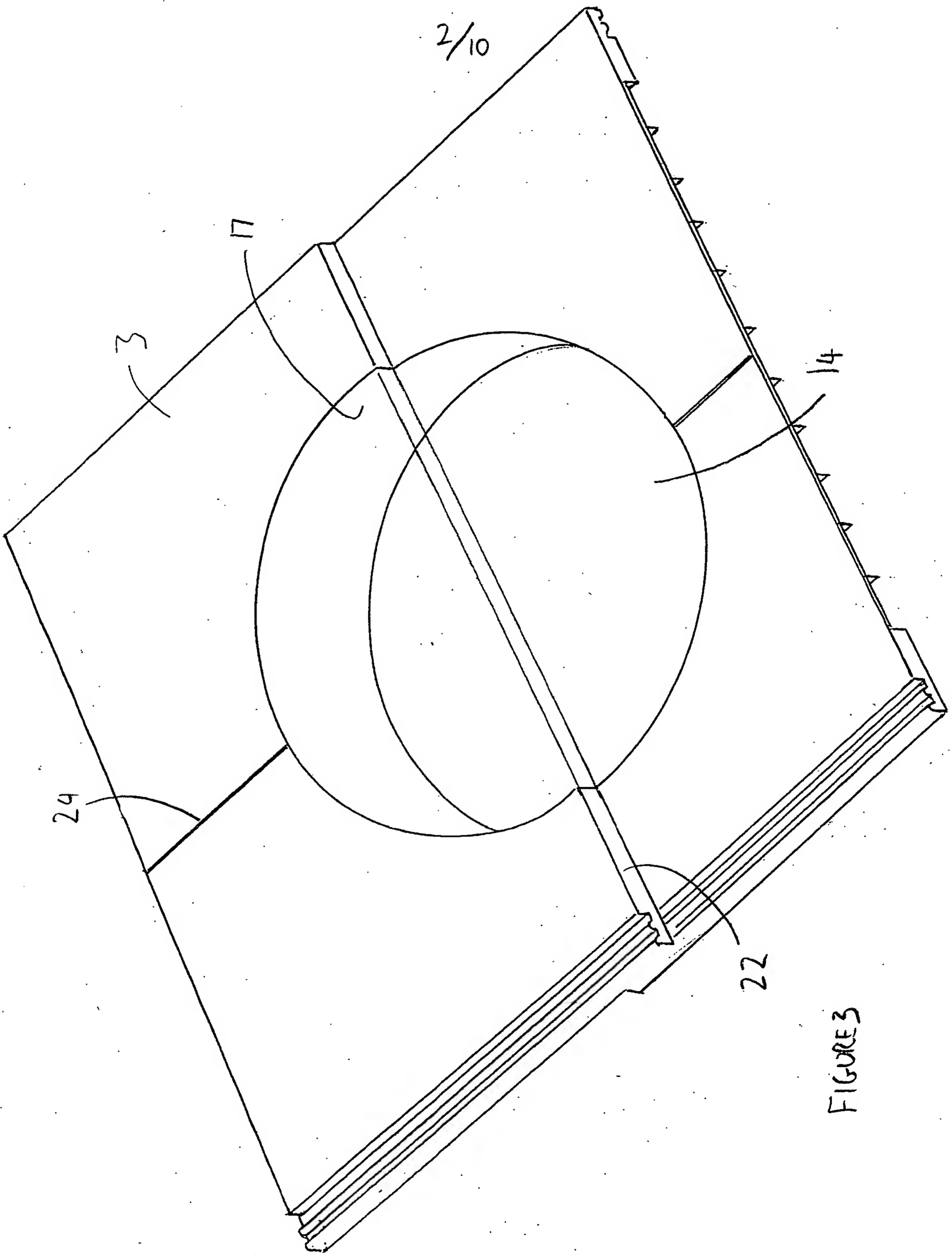


FIGURE 3

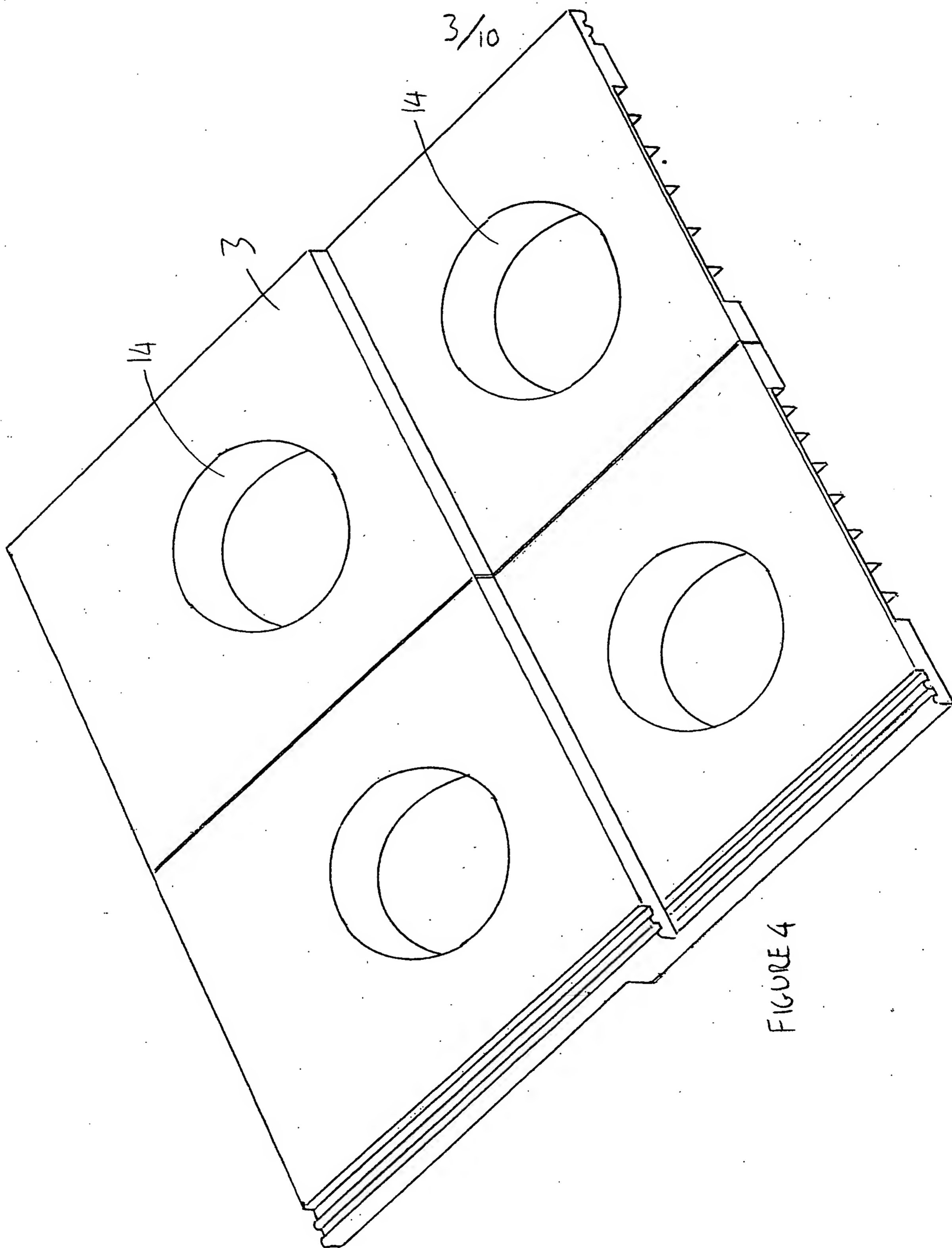


FIGURE 4



4/10

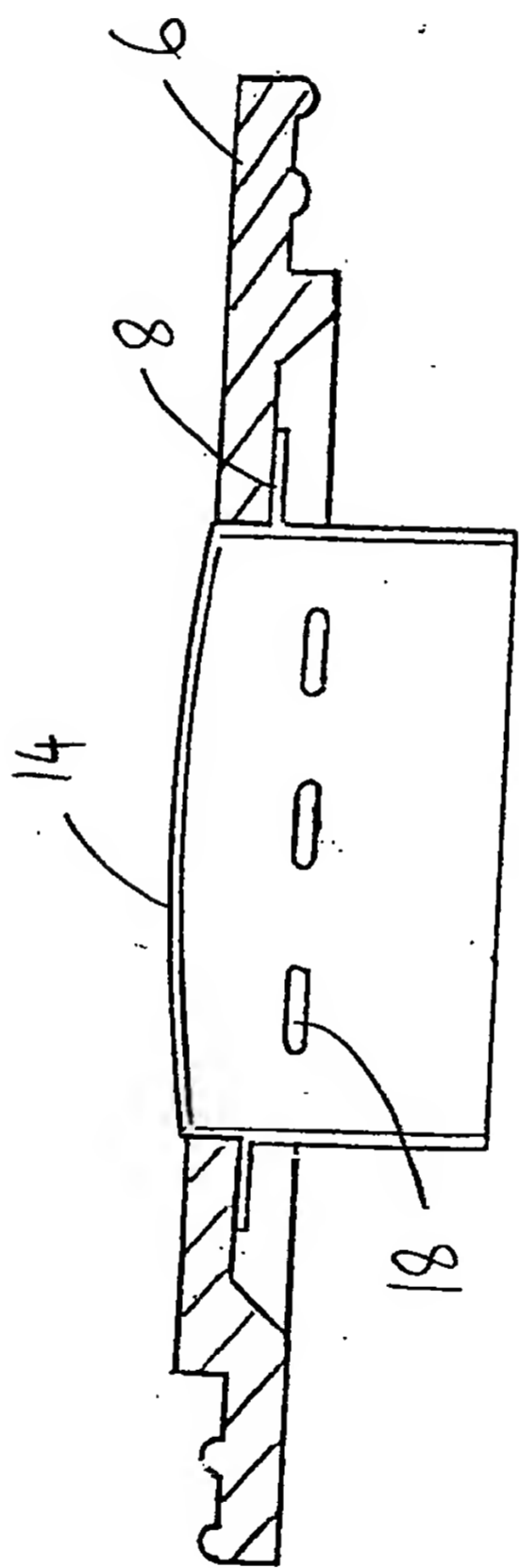


FIGURE 5

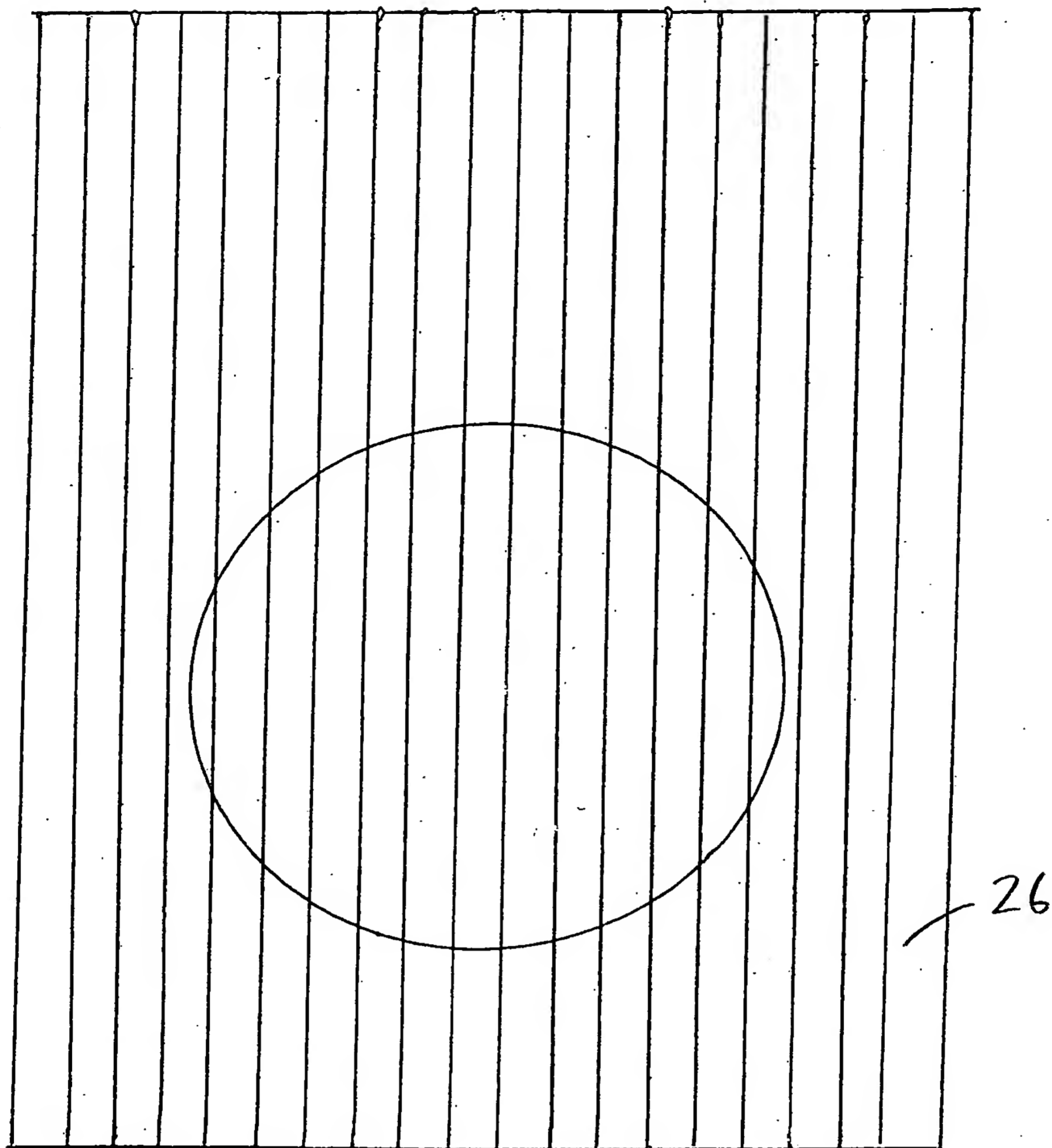


FIGURE 6

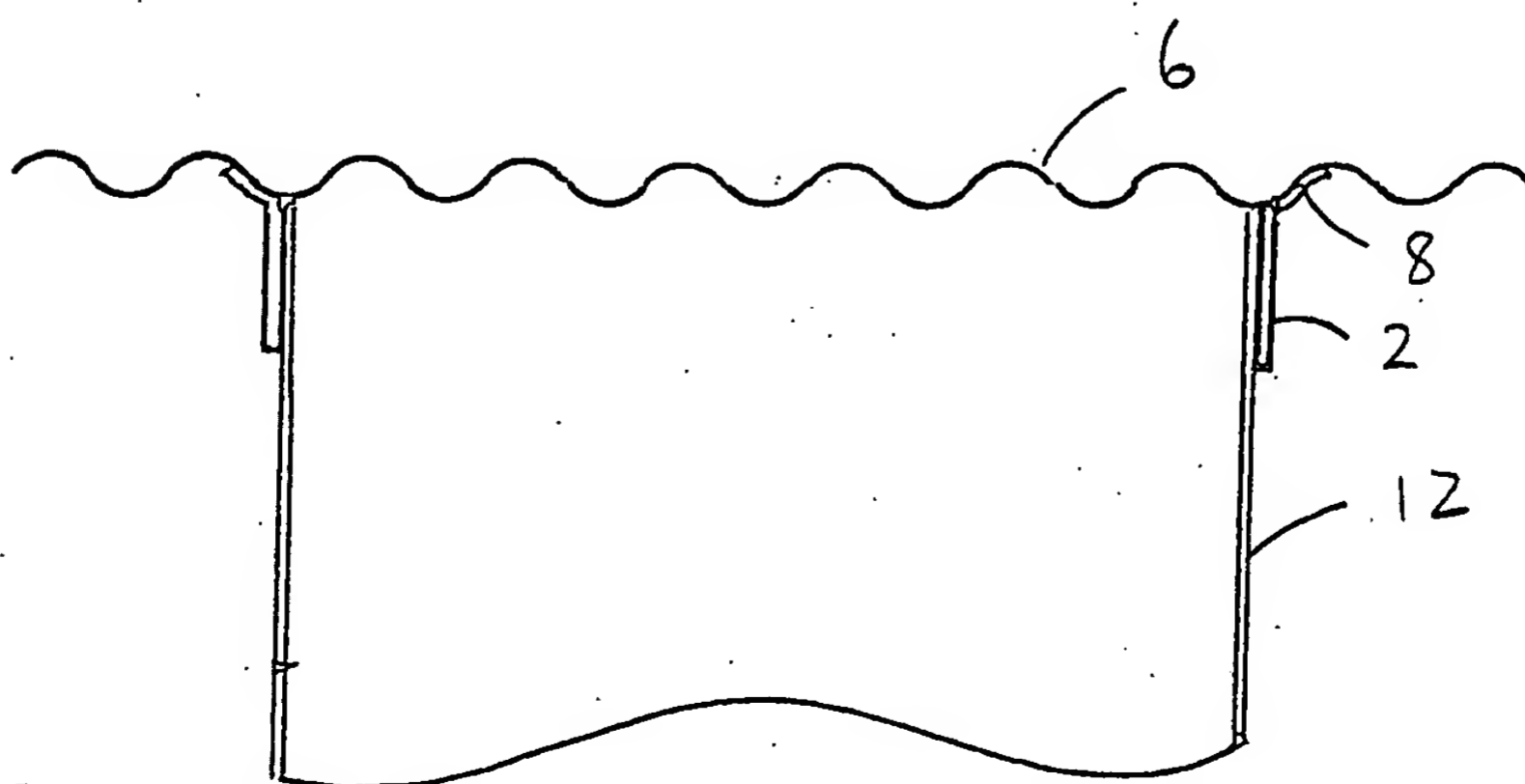


FIGURE 7



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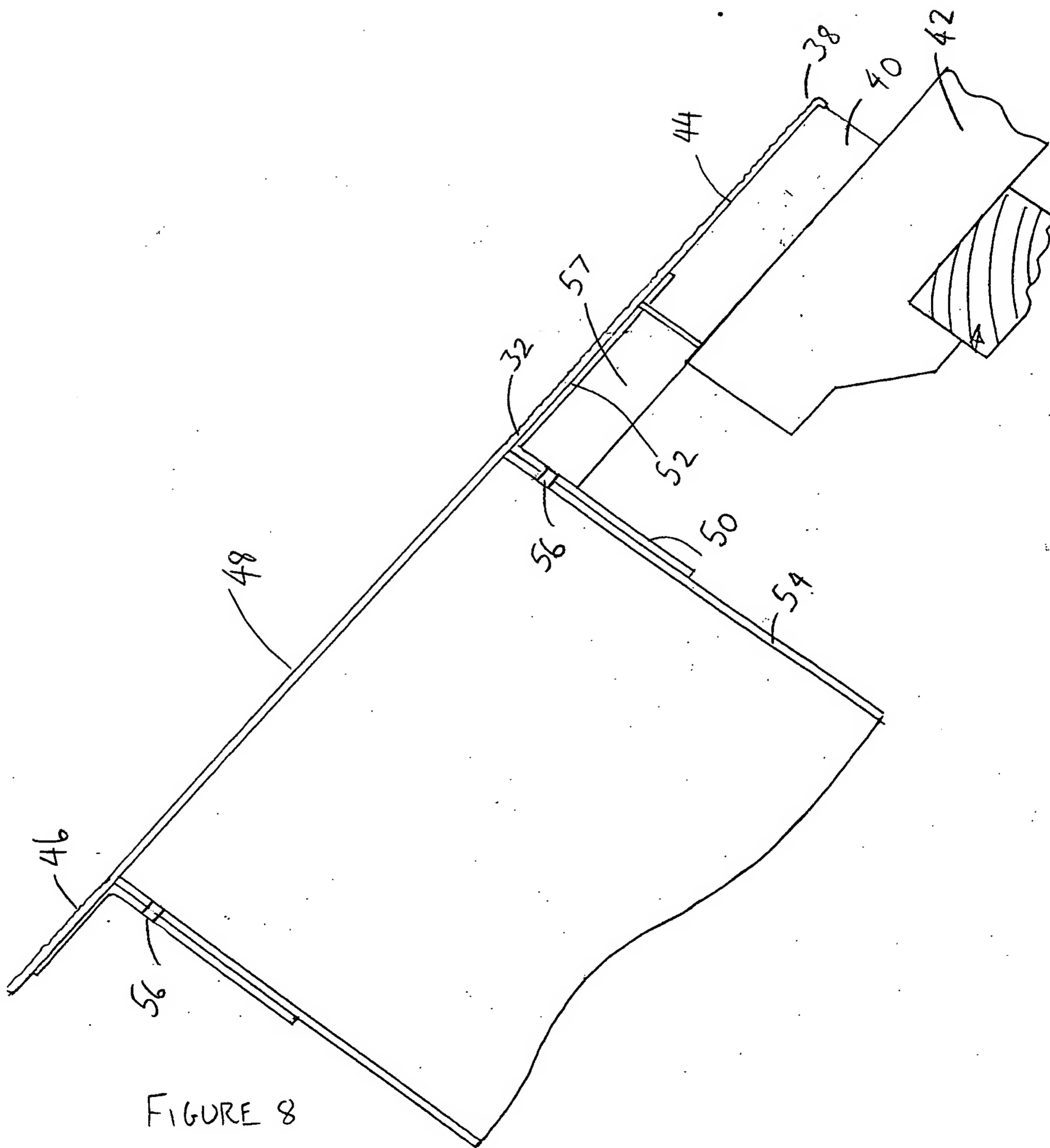


FIGURE 8



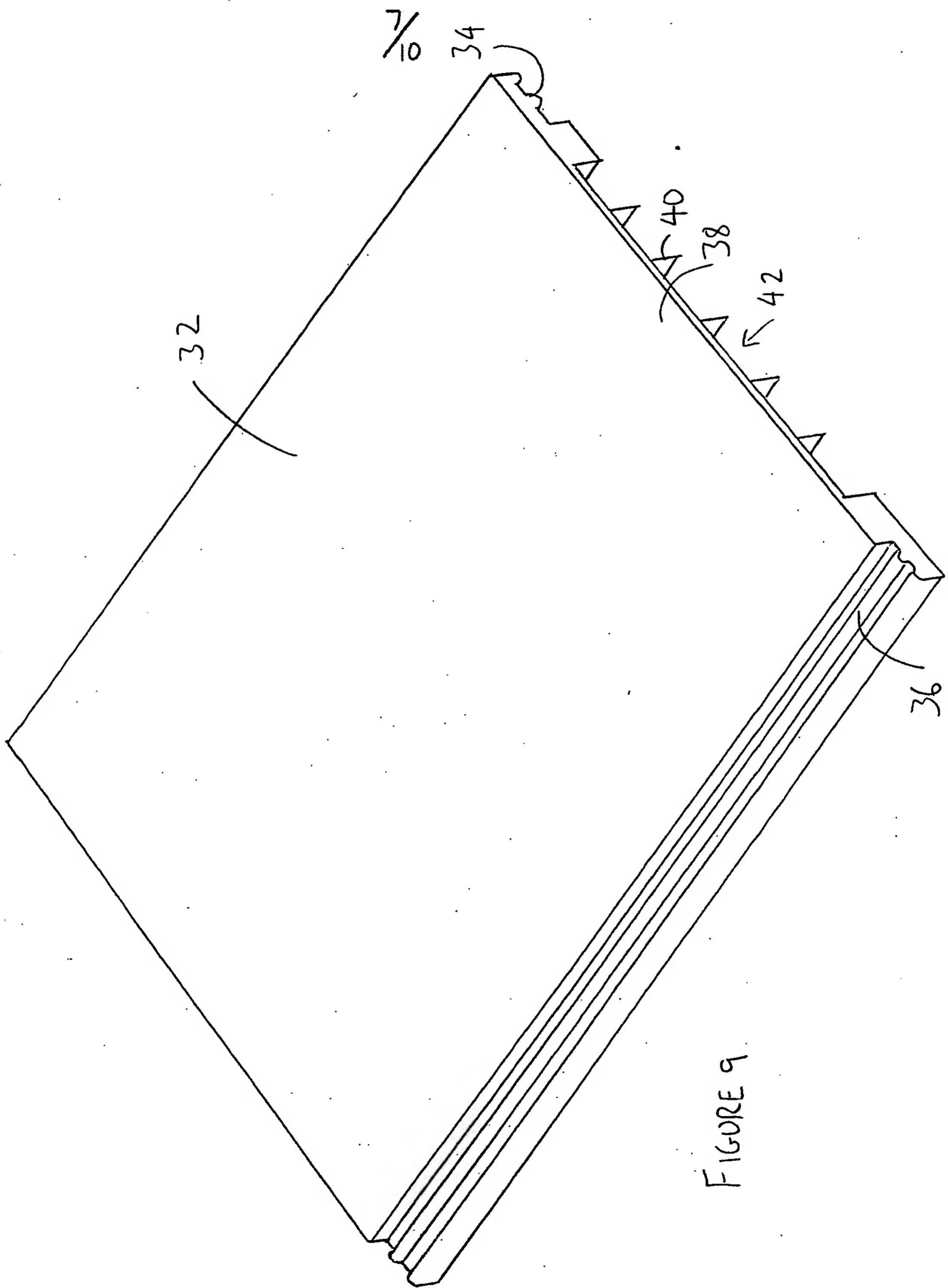


FIGURE 9

